

Mending the heart. Plants used in Peruvian ethnomedicine for heart disease, blood pressure irregularities and cholesterol control

Remendando el corazón. Las plantas utilizadas en la etnomedicina peruana para las enfermedades del corazón, las irregularidades de la presión arterial y el colesterol

Rainer W. Bussmann & Ashley Glenn

William L. Brown Center, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299, USA.

rainer.bussmann@mobot.org,

Abstract

Traditional healers are frequently consulted to treat heart problems and disorders of the circulatory system. Most treatments of the circulatory system involve the purification of the blood in order to improve the general condition of the patient. A total of 60 plant species belonging to 52 genera and 33 families were documented and identified as heart herbal remedies in Northern Peru. Most species used were Asteraceae, followed by Lamiaceae. Asteraceae were under-represented as heart remedies in comparison to the overall medicinal flora of Northern Peru; Lamiaceae and Euphorbiaceae were clearly over-represented. The majority of heart remedies were prepared from whole plants, which is uncharacteristic for the region's medicinal plant preparations. In almost 70% of the cases fresh plant material was used to prepare remedies. Over 90% of the remedies were applied orally. This is very different from the regional average of application. Over 65% of all remedies were prepared as mixtures with multiple ingredients by boiling plant material either in water or in sugarcane spirit. Little bio-medicinal evidence exists to date to prove the efficacy of the species employed as heart remedies in Northern Peru. Only 33% of the plants found or related species in the same genus have been studied at all from a western pharmacological perspective. The information gained on frequently used traditional remedies against heart conditions might give some leads for future targets for further analysis in order to develop new drugs for heart ailments. However, more detailed scientific studies are desperately needed to evaluate the efficacy and safety of the remedies employed traditionally.

Key words: Medicinal Plants, Ethnobotany, cardiovascular problems, heart disease

Resumen

En el norte del Perú se consulta frecuentemente con curanderos tradicionales para el tratamiento de problemas del corazón y del sistema circulatorio. La mayoría de remedios incluyen la purificación de la sangre para mejorar la condición general del paciente. Un total de 60 especies de plantas de 52 géneros y 33 familias fueron encontradas como remedios para problemas de corazón en el norte de Perú. La mayoría de las especies pertenecen a la familia Asteraceae, seguido por Lamiaceae. Sin embargo, las Asteraceae fueron menos representadas en comparación a la flora medicinal total de la región, mientras Lamiaceae y Euphorbiaceae fueron sobre-representados. Un 70% de los remedios fueron preparados con plantas frescas, y en el 90% de los casos la administración es por vía oral. El 65% de los remedios representaron mezclas de ingredientes múltiples, con las plantas sancochadas en agua o aguardiente. Existe muy poca evidencia científica sobre la eficacia de las plantas usadas. Solo un 33% de las plantas han sido estudiadas en ensayos farmacológicos, y la información de este estudio puede ser muy útil para identificar candidatos para tratamiento de problemas de corazón. Claramente se requiere estudios mas detallados sobre la eficacia y seguridad de los remedios.

Palabras clave: Plantas medicinales, etnobotánica, problemas cardiovasculares, infarto cardiaco

Introduction

Cardiovascular diseases are collectively the number one cause of death on the globe, accounting for over 30% of all deaths worldwide, 80% of which occur in lower income countries with often little western healthcare available. Lower income groups have generally a higher prevalence of risk factors (WHO, 2009). Traditional Medicine is used globally and has rapidly growing economic importance. In developing countries, Traditional Medicine is often the only accessible and affordable treatment available. In Latin America, the WHO Regional Office for the Americas (AMRO/PAHO) reports that 71% of the population in Chile and 40% of the population in Colombia have used Traditional Medicine. In many Asian countries Traditional Medicine is widely used, even though Western Medicine is often readily available. In Japan, 60–70% of allopathic doctors prescribe traditional medicines for their patients. Complementary Alternative Medicine is also becoming more and more popular in many developed countries. In the US the number of visits to providers of Complementary Alternative Medicine (CAM) now exceeds by far the number of visits to all primary care physicians (WHO, 1999; 2002). Forty-two percent of the population in the US have used Complementary Alternative Medicine at least once (WHO, 1998), and a national survey reported that the use of at least one of 16 alternative therapies increased from 34% in 1990 to 42% in 1997 (UNCCD, 2000). The expense for the use of Traditional and Complementary Alternative Medicine is exponentially growing in many parts of the world. The 1997 out-of-pocket Complementary Alternative Medicine expenditure was estimated at US\$ 2.7 billion in the USA. The world market for herbal medicines based on traditional knowledge is now estimated at US\$ 60 billion (Breevort, 1998).

Northern Peru is believed to be the center of the Central Andean Health Axis, an area with a particularly vibrant healing tradition stretching from southern Peru to central Ecuador (Camino, 1992), and traditional medicinal practices in this region are still an important component of everyday life (Bussmann & Sharon,

2006; Bussmann, 2006; De Feo, 1992; Joralemon & Sharon, 1993; Polia, 1988; Sharon, 1978, 1980, 1994, 2000; Sharon & Bussmann, 2006). Traditional Medicine is also gaining more and more respect from national governments and health providers. Peru's National Program in Complementary Medicine and the Pan American Health Organization recently compared Complementary Medicine to allopathic medicine in clinics and hospitals operating within the Peruvian Social Security System (EsSalud, 2000). According to WHO (2002), the sustainable cultivation and harvesting of medicinal species is one of the most important challenges for the next few years.

Materials and Methods

Plant Collections

Plants in Peru were collected in the field, in markets, and at the homes of traditional healers (curanderos) in Northern Peru (Fig. 1) in August-September 2001, July-August 2002, July-August 2003, June-August 2004, July-August 2005, July-August 2006, June-August 2007, June-August 2008, March-April 2009 and June-August 2009. A total of 116 informants (10 healers and all market venders) in the Trujillo and Chiclayo area were interviewed using structured questionnaires. Many market venders act as both, providers of plant material, as well as healers with their own small herbal clinics, or give advice on which plants to use for a certain condition. Most dedicated their full time to their profession and charge for their treatments. The informants were always provided with fresh plant material, either collected with them, by them, or available at their market stands. The questionnaires did not include any reference as to disease concepts, plant parts or preparations. In contrast, the participants were only asked simple questions along the lines "What is this plant used for, which part, which quantity, how is it prepared, are any other plants added to the mixture." All questions were asked in the same order. All informants were of Mestizo origin, and spoke only Spanish as their native language. The study covered the four existing medicinal plant markets of the region, and included all venders present. All interviews were conducted with the

same set of participants. The specimens are registered under the collection series "RBU/PL," "ISA," "GER," "JULS," "EHCHL," "VFCHL," "TRUBH," and "TRUVANERICA," depending on the year of fieldwork and collection location. Surveys were conducted in Spanish by fluent speakers. Surveyors would approach healers and market vendors and explain the premise for the study, including the goal of conservation of medicinal plants in the area.

Vouchers of all specimens were deposited at the Herbario Truxillensis (HUT, Universidad Nacional de Trujillo), and Herbario Antenor Orrego (HAO, Universidad Privada Antenor Orrego Trujillo). In order to recognize Peru's rights under the Convention on Biological Diversity, most notably with regard to the conservation of genetic resources in the framework of a study treating medicinal plants, the identification of the plant material was conducted entirely in Peru. No plant material was exported in any form whatsoever.

Nomenclature

The nomenclature of plant families, genera, and species follows the Catalogue of the Flowering Plants and Gymnosperms of Peru (Brako & Zarucchi 1993) and the Catalogue of Vascular Plants of Ecuador (Jørgensen & León-Yanez 1999). The nomenclature was compared to the TROPICOS database. Species were identified using the available volumes of the Flora of Peru (McBride 1936-1981), as well as Jørgensen & Ulloa Ulloa (1994), Pestalozzi (1998) and Ulloa Ulloa & Jørgensen (1993), and the available volumes of the Flora of Ecuador (Sparre & Harling 1978-2009), and reference material in the herbaria HUT, HAO, QCA, LOJA and QCNE.

Results and Discussion

Traditional healers are frequently consulted to treat heart problems and disorders of the circulatory system. The healers encountered used a wide variety of terms relating to heart problems, that in part generalized the condition (e.g. "heart disease"), included references to conditions as underlying cause of heart problems (e.g. "cholesterol"), or simply used terms to indicated

treatment options (e.g. "blood irrigation" as term referring to "thin" a patients blood, "blood purification," or "refreshing the heart" as terms indicating a process cleansing the blood from suspected toxins, or "blood circulation," indicating a treatment that would improve circulation). The use of western style bio-medicinal terms is not surprising, given that all informants were of Mestizo origin, and lived in an urban environment.

Most treatments of the circulatory system involved the purification of the blood in order to improve the general condition of the patient. In addition, the fashionable concept of "weight management" and conditions related to obesity has entered into the domain of Peruvian healers. All healers readily acknowledge the negative influence of high cholesterol levels, and plant remedies were used specifically to lower cholesterol as well as weight loss therapies, while plants used for weight gain were insignificant.

A total of 60 plant species belonging to 52 genera and 33 families were documented and identified as heart herbal remedies in Northern Peru. Most species used were Asteraceae (7 species, 11.67%), followed by Lamiaceae (6 species, 10%), and Solanaceae (4 species, 6.67%). Fabaceae, Amaranthaceae and Cucurbitaceae each contributed 3 species (5%) to the heart pharmacopoeia (Fig. 2). All other twenty-seven families contributed only one or two species each to the pharmacopoeia. A complete overview of all plants encountered, including data on use-recipes and preparation, is given in Appendix 1. Asteraceae are in general under-represented as heart remedies in comparison to the medicinal flora used in Northern Peru; Lamiaceae and Euphorbiaceae are clearly over-represented in comparison to the overall medicinal flora, while some other medicinally important families (e.g. Poaceae, Lycopodiaceae, Rosaceae) are completely missing from the heart portfolio (Tab. 1) (Bussmann & Sharon, 2006).

The majority of heart remedies were prepared from whole plants (37.18%), while the leaves (24.36%), stems (15.38%), and flowers (7.69%) were used less frequently (Tab. 2). Whole plants were more often used than characteristic for the overall medicinal preparations found in the region (Bussmann & Sharon, 2006). In

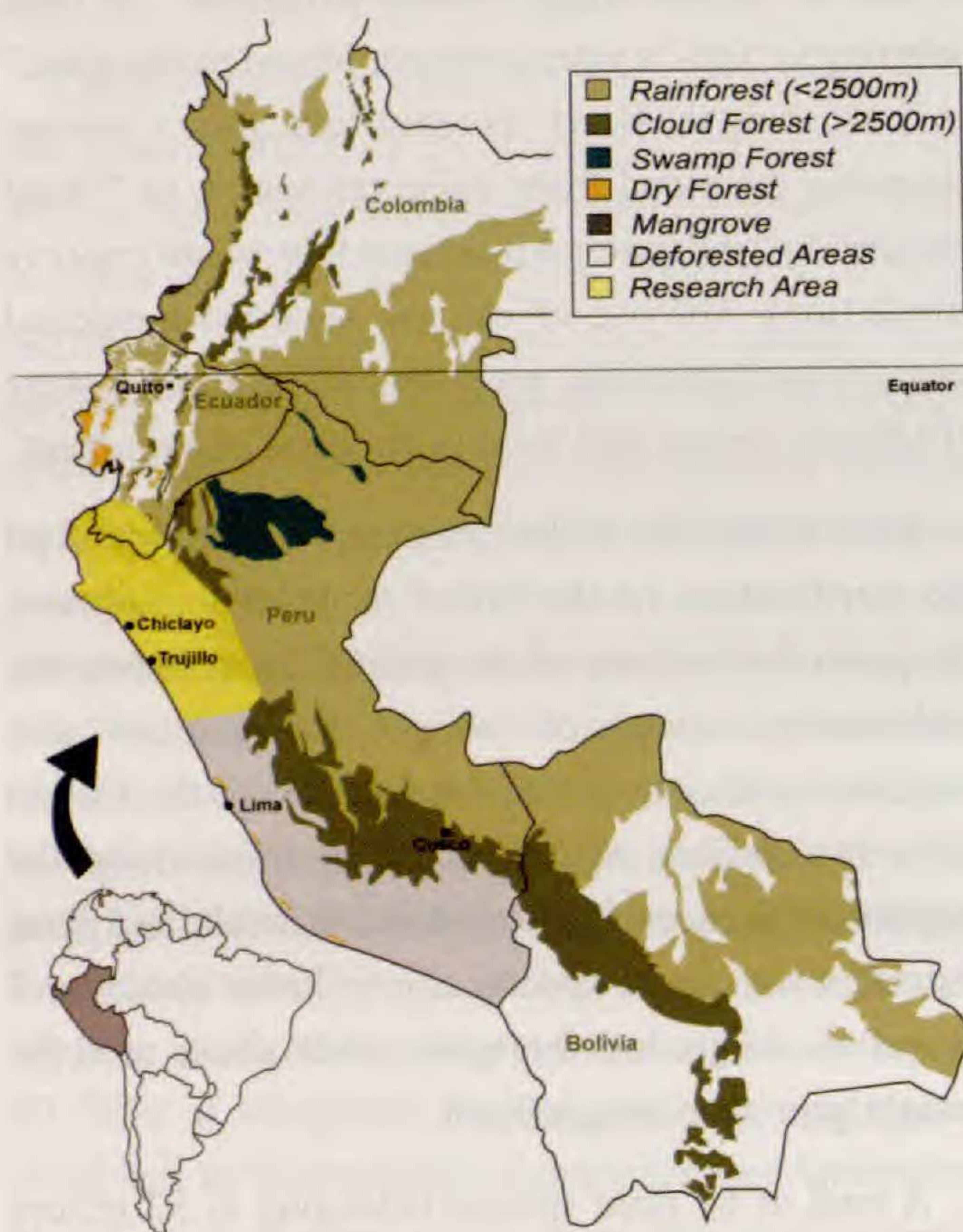


Fig. 1. Research area

almost 70% of the cases fresh plant material was used to prepare remedies, which differs little from the main herbal preparation mode in Northern Peru. Over 90% of the remedies were applied orally, while the remaining ones were applied topically. This is very different from the regional average of application. Over 65% of all remedies were prepared as mixtures with multiple ingredients by boiling plant material either in water or in sugarcane spirit. This indicates that the local healers have a very profound knowledge about the synergistic effects of plants in multi-ingredient preparations.

Table 1. Comparison of heart medicines to the 10 most important plant families of the medicinal flora of northern Peru (after Bussmann & Sharon, 2006)

Heart conditions		Medicinal flora of North Peru	
Family	%	Family	%
Asteraceae	11.67	Asteraceae	13.64
Fabaceae	5	Fabaceae	6.82
Lamiaceae	10	Lamiaceae	4.87
Solanaceae	3.33	Solanaceae	4.09
Euphorbiaceae	6.67	Euphorbiaceae	2.33
Poaceae	0	Poaceae	2.33
Apiaceae	3.33	Apiaceae	2.14
Lycopodiaceae	0	Lycopodiaceae	1.95
Cucurbitaceae	5	Cucurbitaceae	1.75

Most important plant families

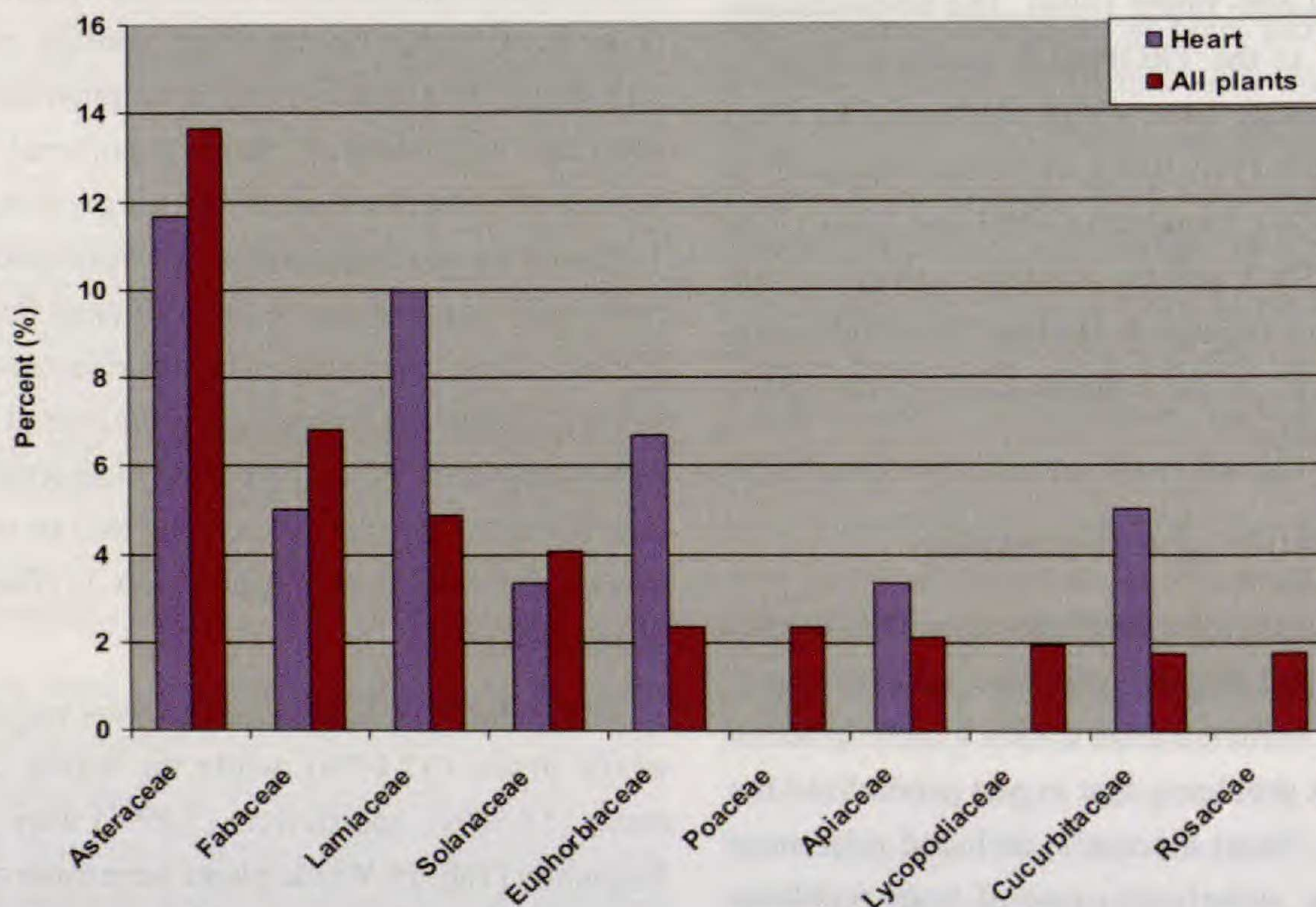


Fig. 2. Most important plant families

Table 2. Plant parts used for treatment of heart conditions

Plant Part	%
Leaves	24.36
Whole plant	37.18
Stems	15.38
Flowers	7.69
Seeds	3.85
Fruit	5.13
Root	1.28
Bark	3.85
Wood	1.28

Little scientific evidence exists to date to prove the efficacy of the species employed as heart remedies in Northern Peru. Only 33% of the plants found or related species in the same genus have been studied at all. *Ambrosia* sp. show some promise in the treatment of myocardial infarction (de Zwaan *et al.*, 2001). *Citrullus* spp., *Sanguisorba* sp., *Viola* sp., *Lavandula* sp. and *Smilax* spp. are used in the Middle East to treat heart problems (Azazieh *et al.*, 2006), the latter species with good indications for clinical efficacy (Kreider *et al.*, 2004). *Cucurbita* spp. and *Cuphea* spp. were found to be effective in Brazil (Neel *et al.*, 1964; Botsaris, 2007). The use and efficacy of *Lathyrus* sp. is widely documented (Abrahams & Cockshott, 1962; Murthy, 1964; Kramsch *et al.*, 1971; Levene, 1978; Ali & Nozaki, 2007). Lev (2006) found *Tamarindus* sp., *Ocimum* spp., *Viola* sp. and *Rosmarinus officinalis* used for heart conditions in Israel. Plantain (*Plantago* spp.) has well documented cardiac effects (Block *et al.*, 2007, Ganji & Kuo, 2008), as do various species of *Citrus* spp. (Raymond *et al.*, 1977, Fukazawa *et al.*, 2004; Lans, 2006; Miller *et al.*, 2007), while *Peperomia* spp. and *Passiflora* spp. are often employed as folk remedies in the Caribbean (Lans, 2006).

Conclusions

The incidence of cardiovascular diseases is rising worldwide, as large populations transition from traditional to less healthy western style diets. The information gained on frequently used traditional remedies to treat heart conditions might give some leads for future targets for further analysis in order to develop new drugs for heart ailments. However, more detailed scientific studies are desperately needed

to evaluate the efficacy and safety of the remedies employed traditionally.

Acknowledgements

The presented study was financed through MIRT (Minority International Research and Training) or MHIRT (Minority Health Disparity International Research and Training), a grant from the National Institutes of Health (Fund: 54112B MHIRT Program, Grant: G0000613). MHIRT-Peru is coordinated by San Diego State University (SDSU), and cooperates with the Universidad Privada Antenor Orrego (UPAO, Herbarium HAO), the Universidad Nacional de Trujillo (UNT, Herbarium HUT and Instituto de Medicina Tropical) and the Clínica Anticona Trujillo (CAT) in Peru. None of the work would have been possible without the invaluable collaboration of our Peruvian colleagues, curanderas Julia Calderón, Isabel Chinguel, and Olinda Pintado, curandero Germán Santisteban, and herbalists Manuel Bejarano, Elmer Cruz, and Iván Cruz. With regard to ritual and therapeutic practices we especially want to thank the above curanderas, as well as curandero Leoncio Carrión, and the constant support of Douglas Sharon.

Thanks also go to Eric Rodriguez (Herbarium Truxillense, HUT) and Abundio Sagastegui, Segundo Leiva, and Mario Zapata (Herbario Antenor Orrego, HAO) for the use of their facilities and their assistance in plant identification.

Most of all, we want to express our sincere gratitude to the people of Northern Peru for sharing their ethnobotanical knowledge.

Literature cited

- Abrahams, D.G. & W.P. Cockshott. 1962. Multiple non-luetic aneurisms in young Nigerians. *British Heart Journal* 24(1):83–91.
- Ali, V. & T. Nozaki. 2007. Current Therapeutics, Their Problems, and Sulfur-Containing-Amino-Acid Metabolism as a Novel Target against Infections by "Amitochondriate" Protozoan Parasites. *Clinical Microbiology Review* 20(1):164–187.
- Azaizah, H.; B. Saad; K. Khalil & O. Said. 2006. The State of the Art of Traditional Arab Herbal Medicine in the Eastern Region of the Mediterranean: A Review. *Evidence Based Complementary and Alternative Medicine* 3(2):229–235.

- Block, G.; C. Jensen; E. Norkus; T. Dalvi; L. Wong, J. McManus & M. Hudes.** 2007. Usage patterns, health, and nutritional status of long-term multiple dietary supplement users: a cross-sectional study. *Nutrition Journal* 6:30.
- Botsaris, A.** 2007. Plants used traditionally to treat malaria in Brazil: the archives of Flora Medicinal. *Journal of Ethnobiology and Ethnomedicine* 3(18).
- Brako, L. & J. Zarucchi (Eds.).** 1993. Catalogue of the Flowering Plants and Gymnosperms of Peru. Missouri Botanical Garden, Saint Louis, MO.
- Breevort, P.** 1998. The Booming U.S. Botanical Market, A New Overview. *HerbalGram* 44:33-46.
- Bussmann, R.** 2006. Manteniendo el balance de naturaleza y hombre, La diversidad florística andina y su importancia por la diversidad cultural – ejemplos del Norte de Perú y Sur de Ecuador. *Arnaldoa* 13(2):382-397.
- Bussmann, R. & D. Sharon.** 2006. Traditional plant use in Northern Peru, Tracking two thousand years of health culture. *Journal of Ethnobiology and Ethnomedicine* 2(47).
- Camino, L.** 1992. Cerros, plantas y lagunas poderosas, la medicina al norte de Perú. Lluvia Editores, Lima.
- De Feo, V.** 1992. Medicinal and magical plants on northern Peruvian Andes. *Fitoterapia* 63:417-440.
- de Zwaan, C.; M. Daemen & W. Hermens.** 2001. Mechanisms of cell death in acute myocardial infarction: pathophysiological implications for treatment. *Netherlands Heart Journal* 9(1):30-44.
- EsSalud/Organización Panamericana de Salud.** 2000. Estudio Costo-Efectividad: Programa Nacional de Medicina Complementaria. Seguro Social de EsSalud (Study of Cost-Effectiveness: National Program in Complementary Medicine. Social Security of EsSalud). Lima, EsSalud/Organización Panamericana de Salud (Pan American Health Organization).
- Fukazawa, I.; N. Uchida; E. Uchida & H. Yasuhara.** 2004. Effects of grapefruit juice on pharmacokinetics of atorvastatin and pravastatin in Japanese. *British Journal of Clinical Pharmacology* 57(4):448-455.
- Ganji, V. & J. Kuo,** 2008. Serum lipid responses to *Psyllium* fiber: differences between pre- and post-menopausal, hypercholesterolemic women. *Nutrition Journal* 7(22).
- Joralemon, D. & D. Sharon.** 1993. Sorcery and Shamanism, Curanderos and Clients in Northern Peru. University of Utah Press, Salt Lake City.
- Jørgensen, P. & S. León-Yanez. (Eds.).** 1999. Catalogue of the vascular plants of Ecuador. - Monographs in Systematic Botany from the Missouri Botanical Garden 75.
- Jørgensen, P.M. & C. Ulloa** 1994. Seed plants of the High Andes of Ecuador - a Checklist. *AAU Reports* 34:1-443.
- Kramsch, D.; C. Franzblau & W. Hollander.** 1971. The Protein and Lipid Composition of Arterial Elastin and Its Relationship to Lipid Accumulation in the Atherosclerotic Plaque. *Journal of Clinical Investigation* 50(8):1666-1677.
- Kreider, R., A. Almada; J. Antonio; T. Broeder; C. Earnest; M. Greenwood; T. Incledon; D. Kalman; S. Kleiner; B. Leutholtz; L.M. Lowery; R. Mendel; J. Stout; D. Willoughby & T. Ziegenfuss.** 2004. SSN Exercise & Sport Nutrition Review: Research & Recommendations. *Journal of the International Society for Sports Nutrition* 1(1):1-44.
- Lans, C.A.** 2006. Ethnomedicines used in Trinidad and Tobago for urinary problems and diabetes mellitus. *Journal of Ethnobiology and Ethnomedicine* 2(45).
- Lev, E.** 2006. Ethno-diversity within current ethno-pharmacology as part of Israeli traditional medicine – A review. *Journal of Ethnobiology and Ethnomedicine* 2(4).
- Levene, C.** 1978. Atherosclerosis—disease of old age or infancy? *Journal of Clinical Pathology Supplement* 12:165-173.
- McBride, J. (Ed.).** 1936-1981. Flora of Peru. Fieldiana, Botany. Field Museum of Natural History, Chicago.
- Miller, T.; D. Neri; J. Extein; G. Somarriba & N. Strickman-Stein.** 2007. Nutrition in Pediatric Cardiomyopathy. *Progress in Pediatric Cardiology* 24(1), 59-71.
- Murthy, M.** 1964. The Effect of Amino-Nitrile-Induced Vascular Injury on Cholesterol-Induced Atherosclerosis in Rabbits. *American Journal of Pathology* 44(2):247-253.
- Neel, J.; Salzano; P. Unqueira; F. Keiter & D. Maybury-Lewis.** 1964. Studies on the Xavante Indians of the Brazilian Mato Grosso. *American Journal of Human Genetics* 16(1):52-140.
- Pestalozzi, H.** 1998. Flora ilustrada altoandina. Herbario Nacional de Bolivia and Herbario Forestal Nacional Martín Cardenas, Cochabamba.
- Polia, M.** 1988. Las Lagunas de los Encantos – Medicina Tradicional Andina en el Peru septentrional. CePeSer, Lima.
- Raymond, T.; W. Connorm; D.S. Lin; S. Warner; M. Fry & S. Connor.** 1977. The Interaction of Dietary Fibers and Cholesterol upon the Plasma Lipids and Lipoproteins, Sterol Balance, and Bowel Function in Human Subjects. *Journal of Clinical Investigation* 60(6):1429-1437.
- Sharon, D.** 1980. El Chamán de los Cuatro Vientos. Siglo veintiuno editores, México, D.F.
- Sharon, D.** 2000. Shamanismo y el Cacto Sagrado - Shamanism and the Sacred Cactus. San Diego Museum Papers 37.
- Sharon, D.** 1994. El Tuno y sus colegas, notas comparativas. In En el Nombre del Señor, Shamanes, demonios y curanderos del norte del Perú, eds. Millones, L. and M. Lemlij, pp.128-147, Australis S.A., Lima.
- Sharon, D.** 1978. Wizard of the Four Winds, A Shaman's Story. Free Press, New York.
- Sparre, G. & B. Harling.** 1978-2009. Flora of Ecuador (various authors). Council for Nordic Publications in Botany.
- Ulloa Ulloa, C. & P. Jørgensen.** 1993. Arboles y arbustos de los

Andes del Ecuador. AAU Reports 30:1-263.

United Nations Conference on Trade and Development.

2000. Systems and National Experiences for Protecting Traditional Knowledge, Innovations and Practices. Background Note by the UNCTAD Secretariat. Geneva, United Nations Conference on Trade and Development, (document reference TD/B/COM.1/EM.13/2).

World Health Organization. 1998. Report, Technical Briefing on

Traditional Medicine. Forty-ninth Regional Committee Meeting, Manila, Philippines, 18 September 1998. Manila, WHO Regional Office for the Western Pacific.

World Health Organization. 1999a. Consultation Meeting on

Traditional Medicine and Modern Medicine, Harmonizing the Two

Approaches. Geneva, World Health Organization, (document reference (WP)TM/ICP/TM/001/RB/98-RS/99/GE/32(CHN)).

World Health Organization. 1999b. Traditional, Complementary

and Alternative Medicines and Therapies. Washington DC, WHO Regional Office for the Americas/Pan American Health Organization (Working group OPS/OMS).

World Health Organization. 2002. WHO Traditional Medicine

Strategy 2002-2005. World Health Organization, Geneva.

World Health Organization. 2009. World health fact sheet.

<http://www.int/mediacentre/factsheets/fs317/en/index.html>.

Appendix 1. Species encountered and used in Northern Peru CIRCULATION AND HEART

Family/Genus/Species	Indigenous name	Plant part used	Admin.	Preparation	Use	Coll. #
ADIANTACEAE						
<i>Adiantum concinnum</i> Wild. ex H.B.K.	Culantrillo del Pozo, Culantrillo	Leaves and Stems, fresh or dried	Oral	20g per 1l of water for 5 minutes combined with Purenrosa, Lancetilla, Moradilla, Oregano. Drink three glasses per day for three days.	Blood purification	VFCHL29, TRUBH17, RBU/PL265, JULS149
AMARANTHACEAE						
<i>Alternanthera halmifolia</i> (Lam.) Standley & Pittier	Paja Morada Lenguetilla, Lengua de Pajaro, Sanguinaria, Moradia, Moradilla, Hierba Morada	Whole plant, fresh	Oral	Boil 1l water, then add 10g total of Toronjil, Manzanilla, Romero, Hinojo, Chanca de Comida, Cascorade, and Membrillo. Let mixture sit for 2 to 3 minutes. Drink lukewarm 3-4 times per day during mealtimes, or as needed. Patient should drink cold solution. It is important to drink it at 6AM and at 6PM.	Heart, Heart disease	JULS85, JULS243, GER23
<i>Alternanthera porrigens</i> (Jacquin) Kuntze	Sanguinaria, Moradilla, Lancetilla	Whole plant, fresh	Oral	5g per 1l, combined with Conchalagua, Moradilla, Colores, Lancetilla, Culantrillo, Hierba del Toro, and Zarza Parilla. Drink 3 times per day up to one year.	Blood circulation	EHCHL142, ISA56, RBU/PL301, RBU/PL324, EHCHL93, GER117
<i>Iresine herbstii</i> Lindley	Colores, Timoras, Zangurache	Leaves, fresh	1. Topical 2. Oral	1. Fresh Leaves only, may use with Yunque, 7 Espiritus, and Bully Vinegar and Contrahierba. As poultice, 3 times a week. 2. Boil 5g per 1l water with Lancetilla, Contrahierba, Cachorillo, or chop, eat fresh. Oral once a day for a week or drink 1l daily, 1 month, always before breakfast.	1., 2. Blood circulation, Heart,	ISA42, EHCHL114, ISA121
APIACEAE						
<i>Apium graveolens</i> L.	Apio Cimarron, Apio	Whole plant, fresh	Oral	Boil 1l water, then add 10g Apio Cimarron. Combine with Manzanilla, Mejorana, and Culantrillo. Drink 4 cups per day for 1 week.	Heart	JULS21, ISA79, ISA116, EHCHL106
<i>Petroselinum crispum</i> (Miller) A.W. Hill	Perejil	Whole plant, fresh	Oral	3-5g of herb per 1l of water, combined with Toronjil, Pimpinela, Mejorana, Siempre Viva. Take 1 glass 2 times a day. Can also be eaten as salad.	Heart, High blood pressure	ISA80, EHCHL31, ISA117, RBU/PL278, JULS225
ARALIACEAE						
<i>Oreopanax eriocephalus</i> Harms	Maque Maque, Mano de León	Leaves and Flowers, fresh	1. Oral 2., Topical	1., 2. Boil 3-10g per 1l of water. Drink 3-4 times per day for 1 month or take as bath.	1., 2. Heart	EHCHL36, JULS39, RBU/PL270, ISA71, GER221
ASTERACEAE						
<i>Ambrosia peruviana</i> Willd.	Altamisa, Marco, Artamisa, Manzanilla del Muerto, Marcos, Alta Misa, Ajenjo, Altamis, Llatama Negra Malera, Llatama Roja Malera	Leaves and Stems, fresh	Oral	Boil 1l water 2 min, then mix water with a total of 10g of Manzanilla, Borraja, Madre Selva, Toronjil, Hinojo and Chancas de Comida for nerve disorders. Use Boldo, Malva, and Linaza for liver ailments. Use Matico, Borraja, Eucalipto, Vira Vira, and Brochamelia for Bronchitis. Cover and let sit for 2-3 minutes. Drink lukewarm, 3-4 cups a day for a month. Colds: Boil 1/2l of water with 50g of Altamiz and 10g of Sauce, Chicoria, and Pajaro Bobo for 10minutes. 2 tablespoons every 8 hours for 8 days.	Heart	JULS108, TRUBH18, RBU/PL370, TRUBH15, JULS90, GER9, GER110
<i>Loricaria ferruginea</i> (R. & P.) Wedd.	Palmerilla, Palmita, Pata de Gallina, Palmera, Trencilla, Palmilla, Patita de Gallo, Palmia Pina, Palmera Blanca	Leaves and Stems, fresh	Topical	Alternative mixture for Spiritual Flowering, see below. 3 times per day, 1 week, only once for florecimiento.	Blood circulation	GER108, RBU/PL339, TRUBH20, ISA136, TRU Van/Erica2310, ISA148(105a)

<i>Matricaria recutita</i> L.	Manzanillon, Agua de la Banda, Manzanilla Blanca, Manzanilla Amarga	Whole plant, fresh	Oral	Boil water. Add 10g of Manzanillon into 1 cup of hot water. Manzanilla, Toronjil, and Pimpinella may be added. Take 1 small cup 3 times a day, for 1 month. Drink lukewarm.	Blood purification	JULS192, RBU/PL306, ISA120, ISA76, GER145
<i>Onoseris odorata</i> (D. Don) Hooker & Arnott	Hierba de Reina	Whole plant, fresh or dried	Oral	10g per 1l boiling water, 3 cups per day.	Heart	RBU/PL337
<i>Picrosia longifolia</i> D. Don	Achicoria, Chicoria	Whole plant, fresh	Oral	Boil 10-50g of Chicoria and Verbena, Canchalagua, Chochocon per 1l water, 1l daily, 15-30 days. Alternatively chop and extract juice of 200g fresh material, drink 1 glass daily, no longer than a week. Overdosing can harm vision.	Purification of the blood,	EHCHL116, JULS6, GER21
<i>Schkuhria pinnata</i> (Lam.) Kuntze	Canchalagua, Canchalagua (Chica)	Whole plant, fresh	Oral	Boil 20g per 1l for 3-10 min. Mix with Ortiga, Lancetilla, Culantrillo, Panisara, Purenrosa, Boldo, Berro, of Flor Blanca and Canchalagua. Take 3 times per day (1l), 1 month. Blood purification: Infusion must sit out over night before drinking.	Blood Cleansing, Blood purification	RBU/PL266, JULS42, VFCHL27, GER228
<i>Sonchus oleraceus</i> L.	Cerraja, Serraja, Zeraja	Whole plant, fresh	Oral	Tea, 5g per 1l boiling water mix with Colores, Lancetilla, Contrahierba. Three times per day.	High blood pressure	RBU/PL368, EHCHL54, JULS64, VFCHL48, JULS248
BORAGINACEAE						
<i>Borrigo officinalis</i> L.	Borrigo	Whole plant, fresh or dried	Oral	10g herb with 1l boiling water, boiled for 3-5 minutes, combined with Vira Vira. Drink three times per day or 1l per day, as long as needed.	Blood problems, Heart	ISA112, JULS24, RBU/PL300, EHCHL58
BRASSICACEAE						
<i>Raphanus sativus</i> L.	Rabanito	Tuber, fresh	Oral	Blend about 50g of raddish. Drink cold in the morning while fasting, 1 glass 1 time a day for 15 days. Drink in the morning while fasting.	Clean blood from toxins	JULS238, GER202
BROMELIACEAE						
<i>Tillandsia multiflora</i> Benth. var. <i>decipiens</i> (Andre) Sm.	Siempre Viva, Siempre Viva Roja	Whole plant, fresh	1. Oral 2. Topical	1. 10g per 1l boiling water. Combine with Toronjil, Clavelin, and Lima juice. Take 3 times a day for 1 month. 2. 20g per 5l water and boil for 20 minutes. Bathe 3 times a week.	Heart	EHCHL15, RBU/PL376
CARYOPHYLLACEAE						
<i>Dianthus caryophyllus</i> L.	Clavel Serrano	Whole plant, fresh	Oral	Add 50g of the plant material, 50g of Huamanripa and 1 cup of water. Boil the mixture for 5 minutes. Drink the mixture cold. Take 1/4 of a cup once a day, for 30 days.	Heart disease, Heart palpitations	GER180
CLUSIACEAE						
<i>Clusia minor</i> L.	Chusgon	Whole Fruit, fresh or dried	Oral	Boil 1l of water, then add 10g of Chusgon. Add Pimpinella, Manzanilla, Toronjil, Barrojo, Romero, and Chancas de Comida. Let it sit for 2-3 minutes. Patient should drink warm solution. 1 cup 4 times a day as needed.	Heart disease	JULS280
CRASSULACEAE						
<i>Echeveria peruviana</i> Meyen	Pinpin, Siempre Viva, Rosa Berta, Haya Rosa	Leaves, fresh	Oral	2 Leaves per 1/2l water, boil 5 min. 1l daily or three times per day.	Heart	EHCHL118, VFCHL33, JULS249
CUSCUTACEAE						
<i>Cuscuta foetida</i> H.B.K.	Yodo	Whole plant, fresh	1. Oral 2. Topical	1., 2. 1 Tbsp boiled with 1 cup water. drink 1 cup per day or apply as poultice.	Goiter	ISA39
CUCURBITACEAE						
<i>Citrullus lanatus</i> (Thunberg) Matsumura & Nakai	Sandia	Bark, dried	Oral	Peel the Fruit take the pulp and blend. Drink cold, 1 glass fasting for 20 days.	Blood circulation, Refresh heart	GER234

<i>Cucurbita maxina</i> Duch.	Zapallo	Seeds, dried	Oral	Oral only in the morning with a glass of water. Take 10 Seeds the first day. Reduce amount by one Seeds each day until, on the 10th day. Take a break of one week before repeating process. Process may last 2 weeks to a month.	Heart disease	JULS272
<i>Cucurbita moschata</i> Duch.	Zapallo	Seeds, dried	Oral	Oral only in the morning with a glass of water. Take 10 Seeds the first day. Reduce amount by one Seeds each day until, on the 10th day. Take a break of one week before repeating process. Process may last 2 weeks to a month.	Heart disease	GER32
EUPHORBIACEAE						
<i>Acalypha mandonii</i> Muell.-Arg.	Chilca Dulce	Whole plant, fresh or dried	Oral	10g of the plant and 1l of water and boil for 3 to 5 minutes. Drink 3 times a day for 2 weeks.	Clean blood from toxins	RBU/PL294
<i>Phyllanthus niruri</i> L.	Chanca Piedra	Whole plant, fresh or dried	Oral	10g of the plant, Cola de Caballo, Llantén, Boldo, Flor de Overo, Caña-caña, Flor Blanca and Flor de Arena and 1l of water and boil for 3 to 5 minutes. Drink 3 times a day for 2 weeks.	Clean blood from toxins	JULS133
<i>Phyllanthus stipulatus</i> (Raf.) Webster	Chanca Piedra	Whole plant, fresh or dried	Oral	10g of the plant, Cola de Caballo, Llantén, Boldo, Flor de Overo, Caña-caña, Flor Blanca and Flor de Arena, and 1l of water and boil for 3 to 5 minutes. Drink 3 times a day for 2 weeks.	Clean blood from toxins	EHCHL167
<i>Phyllanthus urinaria</i> L.	Chanca Piedra	Whole plant, fresh or dried	Oral	10g of the plant, Cola de Caballo, Llantén, Boldo, Flor de Overo, Caña-caña, Flor Blanca and Flor de Arena. and 1l of water and boil for 3 to 5 minutes. Drink 3 times a day for 2 weeks.	Clean blood from toxins	GER152
FABACEAE						
<i>Lathyrus odoratus</i> L.	Tacon Blanco, Pensamiento Blanco	Flowers, Leaves and Stems, fresh or dried	Oral	5g per 1l, 3 min, combined with Toronjil, Pimpinela, Mejorana, and Cedron. Drink 1l per day or 3-4 cups a day for one month.	Heart	VFCHL43
<i>Tamarindus indica</i> L.	Tamarindo	Fruit pulp, fresh	Oral	Remove the pulp from 250g of plant material. Add this to 3 glasses of warm water. Blend the mixture. Drink the mixture cold while fasting. One glass in the morning Once a day for 30 days. Repeat as necessary.	Blood circulation, Heart disease	JULS252, GER219
<i>Trifolium repens</i> L.	Trebol, Trebol de agua	Flowers, Leaves and Stems, fresh or dried	Oral	1 Tbsp per 3l water. Can combine with Lantecilla, Colores. Can also sometimes combine with a little Zarzaparrilla. Drink 1l daily, 1-2 months or take 1 Tbsp of the freshly chopped plant in the morning every day, 1 week.	Blood	ISA47, RBU/PL330, EHCHL30
GENTIANACEAE						
<i>Gentianella dianthoides</i> (H.B.K.) Fabris	Genciana, Egenciana, Amargon, Campanilla	Whole plant, fresh	Oral	Boil 10g Genciana with 1l water for 2 minutes. 1 time per day, take before eating, in the evening, every other day, for 1 week. Overdosing can cause miscarriage in pregnant women.	Blood, Blood irrigation, Blood problems	RBU/PL253, RBU/PL320, JULS56, TRUVan/Erica21, EHCHL136, EHCHL61
<i>Gentianella graminea</i> (H.B.K.) Fabris	Sumaran, Chinchimali, Corpushuay	Whole plant, fresh or dried	Oral	20g per 1l water. 1l daily, 1 week, best with food, because it has a bitter taste. Drink cool while the patient is fasting. Exceeding dosage can lead to blindness.	Blood, Allergies of the Blood, Blood purification, Blood detoxification	EHCHL22, RBU/PL285, VFCHL8, JULS148
GERANIACEAE						
<i>Erodium cicutarium</i> (L.) L'Herit.	Agujilla Blanca, Auguilla, Augilla	Whole plant, fresh	Oral	Boil 1 Tbsp Sap per 1l of water, mixed with Ambarindas, Hierba del Toro and Sanguinaria.r. 1l per day, 1-3 months.	High blood pressure, Low blood pressure	ISA110, ISA54
<i>Pelargonium odoratissimum</i> (L.) L'Herit.	Malva de Oro, Malva de Olor, Malva Olorosa	Whole plant, fresh or dried	Oral	5g per 1l boiling water. Drink 1l per day.	Heart, Blood	TRUVan/Erica14, TRUBH6, EHCHL89, JULS188

LAMIACEAE	Alucema, Alhucema, Labanda	Flowers, Leaves, Stems and Seeds, dried	Oral	Do not use roots. Boil 1l of water, then add a total of 10g of Labanda, Romero, Claveles, Hinojo, Toronjil, Anjenjo, Manzanilla, and Pimpinela for 2 minutes. Patient should drink lukewarm solution. 1 cup 3 to 4 times a day for 1 month.	Heart	GER113, JULS177
<i>Lepechinia meyenii</i> (Walpers) Epling	Salvia, Salvia Real	Whole plant, fresh or dried	Oral	Boil 30g per 1l water. Take with meals, three times per day.	Heart	RBU/PL303, VFCHL17, ISA91
<i>Melissa officinalis</i> L.	Toronjil, Melissa	Whole plant, fresh or dried	Oral	20-30g per 1l water, 2 min, with Pimpinela, Cedron, Mejorana, Siempre Viva, flores de Amelas, Romero, Claveles, Congona, Manzanilla, Mejorana, Pimpinela, Naranja Flowers. Drink 4 cups per day, 1 month.	Heart, Tachycardia	JULS26, EHCHL2, RBU/PL260, VFCHL14
<i>Minthostachys mollis</i> Griesebach	Muña, Chancas de Comida	Leaves and Stems, fresh	Oral	2-10g per 1l of water, drink 1 cup 3-4 times per day, for 3-4 weeks. Patient should drink hot solution. Can also be eaten as a vegetable or in soup.	Heart	EHCHL84, JULS200
<i>Ocimum basilicum</i> L.	Albaca Mistura, Albaca Negra, Albaca, Albaca Morada, Albahaca (costa)	Whole plant, fresh	1., 3 2. Oral	1. Use 20g of herb mixed with Agua Florida, Eucalipto, Alcanfor, Molle, and cane alcohol, Agua del Susto, Flor de Retama, Hierba del Gallinazo. Mix with Ruda Hembra and Macho, Ajenjo, two peppers. Limpia, take it on Tuesday, Friday, and next Tuesday, 3 times. 2. 20g per 1l for 1-2 minutes combined with Tilo, Toronjil, Mejorana, Cedron. Three cups per day for 10 days, before dinner. 3. 100g per 1l for 5-8 minutes combined with Romero, Salvia Real, Yerba Santa, Malva, Olorosa. Bathe three days per week or every eight days.	Low blood pressure	JULS54, EHCHL48, VFCHL13, RBU/PL284, TRUVan/Erica8, GER191
<i>Rosmarinus officinalis</i> L.	Romero, Romero Castilla	Leaves, fresh or dried	Oral	5g with Eucaliptus, Cola de Caballo and Ruda in 1l boiling water. 2 cups per day for 2 days. Take 4 cups per day for 1 month.	Heart	RBU/PL329, ISA78, TRUBH11, EHCHL3, JULS27, VFCHL2, ISA105
LYTHRACEAE						
<i>Cuphea strigulosa</i> H.B.K.	Lancetilla, Gacetilla, Sanguinaria, Gansetilla, Hierba del Toro	Leaves and Stems, fresh	Oral	5-20g per 1l for 3 min, combine with Congona, Claveles, and Madre Selva, Ortiga, Moradilla, Contrahierba, Colores, Agujilla, Colcacer, Pie de Perro, Cola de Caballo, Verbena, Pimpinela, Flor Blanca, Grama Dulce, Esencia de Rosa and Cadillo. Drink 3-4 times per day, 1l daily, take 1 week - 3 months. Patient should drink solution before eating.	Heart	GER104, EHCHL35, VFCHL34, JULS33, ISA51, RBU/PL259, EHCHL43, JULS59, ISA53, GER147
MELASTOMATACEAE						
<i>Brachyotum tyrianthium</i> Macbride	Sarcilleja	Stems, fresh	Oral	5g per 1l water and boil 3-5 minutes. Drink, three times per day for three days.	Blood circulation	EHCHL55
MORACEAE						
<i>Brosimum rubescens</i> Taubert	Palo Sangre, Palo de la Sangre, Ablita	Wood and Bark, fresh or dried	Oral	Chop the small sticks and boil 1 Tbsp Ambarina with 1l water with 50g of Palo Sangre and 50g of Palo Huaco for 10 minutes. Drink 1l daily, 3 months or more.	Blood irrigation	JULS209, ISA49, EHCHL64, RBU/PL311, GER86, EHCHL62
OXALIDACEAE						
<i>Oxalis bulbifera</i> Knuth.	Trebol	Leaves and Stems, fresh	Oral	Boil water, then add 10g of Toronjil, Poleo, Manzanilla, Hinojo, Romero, and other herbs. Let mixture sit for 2-3 minutes. Patient should drink lukewarm solution. Drink a glass 3 to 4 times a day for a month.	Heart	JULS261
PASSIFLORACEAE						
<i>Passiflora edulis</i> Sims.	Maracuya	Flowers and Fruit pulp, fresh	Oral	Add water to the pulp. Drink or consume at all temperatures. Take 1 Fruit a day, as needed.	High blood pressure	JULS193
<i>Passiflora ligularis</i> Jus.	Hoja de Granadilla, Granadilla	Leaves and new Shoots, fresh	Oral	Combine 1l water with 10g of Granadilla. Add Boldo, Cola de Caballo, Chacur and Amor Seco. Boil the mixture for 3-5 minutes. Take 1 cup, 3-5 times a day for 1 month. Do not use if pregnant!	Blood circulation	EHCHL47, JULS163

PIPERACEAE	Congonilla	Leaves and Stems, fresh	Oral		5g per 1l, 1-2 min, combined with Malva Olorosa, Siempre Viva, Contrahierba, Toronjil. Put on the Mesa and later given to the patient. 1 Tsp, 3 times during the night for prevention, or 2 cups daily for 3-4 days for treatment.	Heart	EHCHL95, VFCHL38, RBU/PL298
<i>Peperomia galioides</i> H.B.K.			Oral				
<i>Peperomia inaequalifolia</i> R. & P.	Congona, Kongona	Whole plant, fresh	Oral		Boil 5g per 1l, stronger with Congonilla, Toronjil, Pimpinella, Mejorana, and Pensamiento. The Stems and Leaves are used predominantly. Drink 3 to 4 times per day for 1 to 2 months.	Heart	TRUBH12, JULS30, VFCHL39, EHCHL8, RBU/PL297, GER80
PLANTAGINACEAE							
<i>Plantago major</i> L.	Llantén	Leaves, fresh	Oral		Boil 20-30g per 1l, 3-5 min. mix with Ortiga, Berros, Lancetilla, Chanca Piedra, Flor Blanca. Drink 1 time per day for 3-8 days. Too much might harm vision.	Blood purification	VFCHL50, EHCHL11, TRUVan/Erica13
POLYGALACEAE							
<i>Polygala paniculata</i> L.	Canchalagua	Whole plant, fresh or dried	Oral		3-5g per 1l of water, 3 times per day, for one week.	Blood circulation	EHCHL59
RANUNCULACEAE							
<i>Laccopetalum giganteum</i> (Wedd.) Ulbrich	Huamanripa, Pacra, Flor de Guarmarya	Whole plant, fresh	Oral		Boil 10g of Huamanripa and 10g of Congona with 1/2 cup of water for 10 minutes. Patient should drink cold solution. 1/2 cup 1 time a day in the morning while fasting for 25 days.	Heart disease, Palpitation	VFCHL53, GER162, RBU/PL321, EHCHL42, JULS284,
ROSACEAE							
<i>Fragaria vesca</i> L.	Fresa	Leaves, fresh	Oral		Boil 1l of water, then add 10g of Fresa. Mix with 10g total of Hinojo, Manzanilla and Pimpinella. Let sit for 2-3 minutes. Drink warm, 1 cup 2-3 times a day for 1 month.	Heart disease	JULS158
<i>Sanguisorba minor</i> Scop.	Pimpinella, Flor de Overa	Whole plant, fresh	Oral		5g per 1l water, mix with Cadillo, Hierba del Apostema, Esencia de Rosa, Lancetilla, Toronjil, Congona, Clavela, Manzanilla, and Azares. Drink 3 times per day 6-12 months.	Heart, Blood	EHCHL117, JULS25, RBU/PL262, GER170, VFCHL20, TRUBH35, ISA 57,147(103a),
RUTACEAE							
<i>Citrus limetta</i> Riso	Lima	Fruit, fresh	Oral		Squeeze juice and remove the Seeds. 1 glass 2 times a day for 2 days.	Heart disease	JULS182, GER177
SALICACEAE							
<i>Populus deltoides</i> Bartram	Alamo	Leaves, fresh or dried	Oral		Boil 1l of water, with 10g of material. Add Manzanilla, Toronjil, Pimpinella, Hinojo, Chancas de comida and Cascara de Membrillo. Let mixture sit for 2-3 minutes. Drink warm, 1 cup, 3-4 times a day for 1 month.	Heart	JULS93
SMILACACEAE							
<i>Smilax medica</i> M.Martens & Galeotti	Zarzaparrilla, Zarza Parilla	Stems, dried	Oral		In 1 cup of water boil 20g of Zarzaparrilla plus 20g of Congona, Chajur, Matico and Cola de caballo for 5 minutes. Drink in the morning while fasting. 1 cup 3 times a day for 1 month in the morning before breakfast. Repeat if necessary.	Heart	GER218, JULS273
SOLANACEAE							
<i>Cestrum auriculatum</i> L'Herit	Hierba Santa, Agrasejo	Leaves, fresh or dried	1. Topical 2. Oral		1. Boil 1 bundle (20g) Hierba Santa per 3l water. Combine with Quinual, Eucalipto, and Romero de Campo. Wash with herbs and bathwater or use for limpia. 3 times per month as needed. 2. 5g per 1l with Corpus Way, Carqueja, and Flor de Overo. Drink 1l per day	1, 2. High blood pressure, Cholesterol	JULS166, RBU/PL281, EHCHL172, ISA122, GER174, EHCHL102
<i>Cestrum nocturnum</i> L.	Flor de Azares	Flowers, fresh	Oral		Boil 1 Tbsp with 1l water and mix with Pimpinella and Cadillo. 1l per day, 1 month.	Heart	ISA142
VIOLACEAE							
<i>Viola tricolor</i> L.	Hierba del Tacón, Pensamiento	Whole plant, fresh or dried	Oral		Boil 1l water, then add 10g Pensamiento Amarillo, used with plants for the heart, including Toronjil. Drink 3 cups per day as needed.	Heart	JULS36, VFCHL19